AVIATION

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Macready climbing for his altitude record

VOLUME XIX

NUMBER 4

SPECIAL FEATURES

SUPERCHARGERS

THE R.A.F. DISPLAY

THE AIR MAIL ROUTES

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Great Silence

IN the early days of the automobile, while the chain drive was still used and proper mufflers had not been invented, one often heard people say how noisy it would be if such contraptions came into general use. Automobiles have come, but they have discredited the prophecies of the early pessimists by becoming quieter than horse drawn vehicles. The silencing of the automobile was accomplished deliberately, but much of it came about because noise meant friction and wear and the quieter engine was more efficient.

Today, when a Martin Bomber or an F5L roars overhead, awaking one's early morning slumbers, or shattering the peace of an evening, even an aviation enthusiast has visions of a terrible future when the whole heavens will pulsate to the whirling beat of propellers. At present, aviation has more fundamental problems to consider than the disturbance of mere ground crawling mortals, but once these problems are on the way to solution, the problem of noise will assume greater importance. In fact, even now, the deafening noise of traveling by plane is an important factor in deterring passengers from commercial air lines. A silent plane would also have great advantages in machine gun and bombing surprise raids, and an observer would see a great deal more if the ground troops were not all aware of his presence before he could see them.

Long stacks and cowled engines have quieted the power plant, but the aerodynamic noises which may be the key to much inefficiency are still practically an untouched field. The whirr of a propeller, or its pop and crackle when its peripheral speed approaches that of sound, is undoubtedly an indication of a lack of efficiency. When the power plant is functioning the whistling of the wires is not noticed, but in a glide one hears a variety of sounds which indicate a broken air flow and wasted power, just as certainly as a squeak in an automobile indicates friction and wear. Of course, it does not take much power to produce these sounds but as we reach ultimate refinement in design, all the available power will be utilized and airplanes will become quieter.

New Aircraft

IT has always been a feature of the annual Royal Air Force Displays to have a "fly past" of new types of aircraft. In recent years the custom has arisen of making this the first public announcement of the new types that are developed. There is no corresponding event in this country. Several new designs have appeared at some of the national race meets but these machines were there as entrants in some event or merely as transportation for some officer, not primarily to be seen.

It would be an excellent thing if such a "fly past" were made a feature of our national air meets. While it is true that our service squadrons are mounted on reconditioned war-time machines for the most part, it is not true that there has been no development of new types. Our latest pursuit planes are the best in the world. The winner and the runners up in the recent observation plane contest are superior to those of any other air power. Several very interesting designs for attack planes, transports, ambulances, etc have been produced. If the best of these machines were given a public showing, the public would have more faith in American designers and would be induced to inquire why the military and naval air services are not better equipped.

Radio

ONE of the features of the aerial participation in the Joint Army and Navy Maneuvers at Hawaii was the extensive use of radio, both in the air and on the ground. Major Brant stated in his review of the problem that the Air Services stationed in Hawaii should devote considerable time to radio training. This is true in this country as well. Air Service personnel seem to regard radio as being all very well in its way but of doubtful use to them.

This condition is not the fault of the members of the Service Squadrons. As has been the case with practically all other military materiel, the War left the Army and Navy Air Services an enormous amount of war-time radio apparatus. This apparatus was the best in the world in 1918, but is quite obsolete now. In consequence of our policy of using up this materiel in the interest of economy, and building new designs in experimental quantities only, the average squadron officer is not aware of the tremendous advances that have been made.

Modern equipment is now being issued for service test. The few sets that have been issued to the flying fields are being used in an increasing variety of ways, as the squadrons become acquainted with their capabilities. One of these has been the reporting of events and the retransmission of the reports by broadcasting stations. The use of reliable radio apparatus is modifying aerial observation and spotting by permitting much more extensive reports and a more rapid interchange of signals than has been the case heretofore.

Another application of modern equipment is voice controlled maneuvers. This in itself is nothing new. President Wilson gave orders to a formation in the air in 1918. This was only in the nature of a demonstration. The equipment then available did not permit of this being done as a regular part of the work over the lines. In fact, it was only in the later stages of the war that formation flying became compulsory. In the next war, after aircraft production gets started, anything smaller than a squadron will very likely be cut off and destroyed. Radio is a necessity for the effective control of this number of machines. The air force that has the best developed radio, both materiel and operating personnel, will have a great advantage.

Superchargers

By DAVID GREGG

Research Engineer, Engineering Division McCook Field

The basic factor which determines the power output of an internal combustion engine is the weight of fuel burned in a given time. However, for proper combustion a fixed ratio must be maintained between the fuel and the air, hence it may be said that the power depends directly on the weight of air used. The volume of air used at each stroke is constant, but the weight depends upon the engine speed, throttle opening, resistance through the intake valves, etc.

Concurrent with the development of the internal combustion engine, attempts have been made to increase the weight of air burned in any given engine by some external device. For example, most Diesel engines have separate cylinders for compressing and delivering air to the power cylinders in excess of the quantity that these cylinders would ordinarily suck in. A supercharger is simply an external air pump designed to supply this extra air. In an aviation engine it is used to maintain constant density of intake air as higher altitudes are reached and the surrounding atmosphere pressure decreases.

For a supercharger to be economically applied to an airplane engine three factors must be considered, namely weight, bulk and fuel consumption. The Liberty engine weighs with water approximately 920 lb. and develops 420 h.hp. At 25,000 ft. this brake horsepower is only 162.5 or 38.7 per cent of the sea level power. The weight per horsepower at this altitude is 5.66 lb. per hp. The actual weight of a supercharger to maintain approximately sea level power on the Liberty engine is 182 lb. which includes the increased weight of the cooling system. The total weight of the supercharged Liberty engine is 1102 lb., the power output at 25,000 ft. is 400 hp., and the weight per horsepower is 2.75 lb., or less than one-half of that of the unsupercharged engine. The power of the unsupercharged Liberty would have to be increased to 246 per cent to bring it up to that of the supercharged engine. It is obvious that such an increase would be impossible without greatly increasing the weight and bulk of the engine.

In fuel consumption the supercharged engine has a decided advantage, as the constant density of intake air maintained by the supercharger keeps the specific fuel consumption at approximately the normal rate, while the specific fuel consumption of the unsupercharged engine increases 12.8 per cent in 25,000 ft.

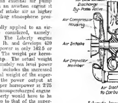
From the foregoing it is apparent that a supercharger can be economically applied to an aviation engine and is an actual necessity for high altitude flying.

Classification

As a supercharger is nothing more or less than an air pump, there are several types available for consideration. First, is the piston type or compressor. This operates at low speeds, is complicated and bulky mechanically, and, although having a high efficiency, is altogether too large and heavy to be considered for aviation purposes.

The second classification is the rotary blower, such as a gear pump, vane pump or Roots blower. Pumps of this type are less bulky than the piston type, operate at speeds as high as 5,000 r.p.m. with an efficiency of perhaps 60 per cent. The Roots blower has certain mechanical disadvantages due to the gear train necessary to give the two rotating impellers the proper angular rotation. The clearances must be sufficient to prevent the impellers from rubbing together, or from rubbing against the compressor housing and yet must be small enough to prevent excessive leakage of air. As the pressure rise with this type of pump is independent of speed, it is used with some success as an automobile supercharger.

The third classification is the centrifugal compressor which consists simply of an impeller rotating in a closed casing. It is extremely simple mechanically as it has only one moving part; it operates at very high speeds and has a slightly better efficiency than the rotary blower. The type of pump used for the compressor must be considered in connection with the method of drive. In large multi-engine airplanes it is possible to use a separate driving engine such as a 150 hp. Hispano engine or similar engine with a pump which supplies air both to the driving engine and to the other engines of the airplane. A separate drive of this nature is equally as reliable as the other engines installed in the airplane and the failure of the supercharger will not affect the operation of the other engines at low altitudes.



Schematic layout of a turbo supercharger

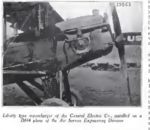
The supercharger may also be geared directly to the engine which it supercharges and, in this case, its reliability is dependent upon the gear drive. A rotary blower, such as the Roots, can be built to operate at crankshaft speed; however, a double set of gears, one on each side of the two impellers in the Roots blower, are necessary to provide the proper angular rotation of the blower and keep the impellers from rubbing. These gears are necessary regardless of whether or not the blower is driven at crankshaft or higher speeds. While some experimental work has been done by the National Advisory Committee on this type of blower, it is not yet possible to draw any definite conclusions as to its ultimate success in large units, and it certainly offers more mechanical complications than the centrifugal type.

When the centrifugal blower is driven by direct gearing from the engine a gear ratio of from 8 to 1 to 15 to 1 is necessary as the blower must operate at speeds between 20,000 and 30,000 r.p.m. in order to reduce the size of the compressor and to provide a sufficient compression ratio. The high speed of the impeller when geared directly to the engine involves considerable difficulties in the gear train and bearings due to the inertia of the moving parts. The Engineering Division has done a great deal of experimental work along these lines and has had no difficulty with gear trains operating at pitch speeds as high as 7,000 ft./min. Ball and roller bearings have been used in these installations to maintain accurate gear centers and to reduce the friction and lubricating difficulties. The problem of ball bearings at these high speeds is one of centrifugal stress in the bearing itself rather than loads imposed by the operation of the supercharger. It is yet uncertain whether or not it will be possible to successfully operate anti-friction bearings at such high speeds and still have them thoroughly dependable over a long period of time. The inertia of the impeller and the moving parts and the

fact that they are directly geared to the engine causes frequent fatigue failures, due to the transmission of engine vibration and torsional vibration of the crankshaft through the gear train. In the smaller sizes, geared superchargers have operated quite successfully without mechanical difficulties and have shown reasonable reliability over long periods of time.

Another method of drive is by means of a gas turbine developed first by M. Rateau of France and later by the General Electric Co. for the Air Service. It offers probably the simplest and most reliable method of drive for an airplane supercharger. The speed of the gas turbine is very high coinciding with the necessary speed of a centrifugal compressor, and as developed by the Engineering Division at the present time the superchargers are reliable and run practically without attention. As there is no mechanical connection between the supercharger and the engine it is not affected by variation in engine speed, or by vibration within the engine itself. The control is extremely simple and the installation rugged and reliable.

Either a geared or turbo supercharger used with the Liberty engine to maintain sea level presure at 20,000 ft. requires approximately 56 hp. In the geared supercharger the power is taken directly from the crankshaft of the engine, and therefore a Liberty engine to maintain its full power output at 20,000 ft. must develop at the crankshaft 476 hp. The power required to drive the supercharger is partially recovered, as the engine has its carburetor air supplied at 14.17 lb. per pressure and exhausts at only 7 lb. per sq. in. pressure. The combustion space at the end of the exhaust stroke is therefore filled with gas at only 7 lb. pressure and on the intake stroke the engine takes in not only the volume of air equal to the displacement of the piston but also sufficient volume to fill the combustion space up to the pressure of the intake air. The additional volume of gas taken into the cylinders and the low atmospheric pressure of the exhaust produces an increase in the mean effective pressure which practically compensates for the power required to drive the supercharger. At lower altitudes, however, this is not the case. Take for example flying just at sea level. There is a minimum power required to drive the supercharger, which in this case is between 20 and 30 hp. At sea level the supercharger is not supplying additional power to the engine, so the actual output of the engine will be 420 hp. less this minimum power required to drive the supercharger. In other words, a gear driven supercharger develops less than normal horsepower at low altitudes and will maintain approximately full normal horsepower at the rated altitude of the supercharger.



Liberty type supercharger of the General Electric Co., installed on a DH4 plane of the Air Service Engineering Division

The turbo supercharger derives its power from the residual heat and energy left in the exhaust gas at the end of the expansion stroke. The gas is collected in a manifold, discharged through a series of nozzles onto a turbine wheel mounted on the same shaft as the impeller. At altitude, the exhaust gas is kept slightly above sea level pressure, and expands through the nozzles to an atmospheric pressure of approximately 7 lb. per sq. in. The energy taken from the gas during this pressure drop is sufficient to drive the turbine and supply a full charge of intake air at sea level pressure. The control is by means of a gate which allows the unused portion of the exhaust gas to discharge directly to the atmosphere. At the ground the gate is kept wide open and the exhaust is discharged at atmospheric pressure, so that the supercharger places no load on the engine at sea level. It should also be noted that at altitudes the power output of the engine does not exceed its normal output on account of the supercharger, whereas in the gear drive the crankshaft must transmit not only the normal horsepower of the engine but also the necessary horsepower required to drive the supercharger. The first problem in the design of a turbo supercharger was the extreme heat of the exhaust gas. This is in the neighborhood of 1,500 deg. F. Difficulty was encountered with the manifolds and nozzle boxes used to convey the gas to the turbine wheel. The joints between the exhaust ports and manifolds, and between the various parts of the manifolds would crack and leak, the nozzle box and nozzle ring would warp and distort and frequently rub against the turbine wheel. The turbine buckets rotating at better than 20,000 r.p.m. were severely stressed and as the elastic limit of their material was reduced by the high temperature of the gas in which they operated the buckets frequently pulled out and broke. In the compressor end difficulties were met with the bearings, methods of mounting, and minor construction details.

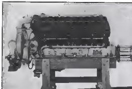
Difficulties Removed

The Engineering Division after five or six years steady development and experimental work on the turbo supercharger has overcome practically all former difficulties. The manifolds are joined together by flexible expansion joints wrapped with asbestos tape and covered with a steel clamp. These joints maintain the necessary pressure and are flexible enough to allow for expasion and contraction without stressing the manifolds or other structure. The supercharger has been mounted on the side of the airplane with the turbine wheel overhung, and exposed to the slipstream of the propeller. In this way the buckets are kept cool, the exhaust gas is discharged freely to the atmosphere without unnecessary back pressure, and the operating conditions are much more favorable than in the former nose type supercharger. The bearings have been simplified and at the present it is very unusual to have any bearing trouble, in spite of the fact that speeds as high as 34,000 r.p.m. have been maintained. Developments are now under way to replace plain babbitted bearings of the turbo supercharger by ball and roller bearings which will be packed with lubricating fluid and will remove the necessity for pressure oil feed to the supercharger, and drain lines from the bearings. This will simplify the installation and make it unnecessary to consider the lubrication of the supercharger except at long intervals, when the lubricant in the bearings will be renewed by means of a grease gun, such as the Alemite or other high pressure system.

The early difficulties in supercharging were not with the supercharger alone, many changes were found necessary in the engines to which the supercharger was applied. In fact, overcoming of these latter difficulties was equally as important as the development of the supercharger itself.

When air is compressed its temperature is raised due to the heat of adiabatic compression. As the supercharger is not 100 per cent efficient, the turbulence, friction losses, etc. increase the temperature of the compressed air. When this air was pumped to the carburetors the resulting mixture temperature was so high that preignition would occur on full throttle running at altitude. The obvious solution was the addition of an air cooler, located between the supercharger and the carburetors, to reduce the air temperature to a point at which the engine would run satisfactorily without preignition or detonation. In spite of the air cooler, the mixture temperature at altitude is hotter than the mixture in an unsupercharged engine. It has been found that spark plugs with small electrodes soon become incandescent and are themselves a contributing factor to preignition. Plugs with larger electrodes having adequate cooling surface overcame

thus trouble. In a number of cases where spark plugs with the porcelain insulation were used, the porcelain cracked, pieces fell in the engine cylinder and were blown out with the exhaust gases into the turbine wheel and the pieces of porcelain striking the buckets moving at very high velocity completely wrecked them. For this reason, mica plugs are used on all turbo-supercharged engines.



Gear driven supercharger on a Curtiss D12

The next serious difficulty was with the fuel systems. On the old machines the pressure system was used, but as the engine was supercharged and the pressure in the carburetor bowl increased, an excessive pressure was required in the gas tank to force the fuel in the carburetor against the supercharger pressure. Fuel pumps were then tried but it was found that they would not work satisfactorily unless they were located lower than the level of the fuel in the tank, as at high altitudes the fuel would vaporize and could not be lifted to the level of the pump. The present satisfactory fuel system consists of a gear pump driven by a flexible shaft and located lower than the fuel tank. Fuel flows to the pump by gravity and is pumped through a supercharger relief valve to the carburetors. This relief valve consists of a spring loaded valve on which is maintained the same air pressure as the supercharger maintains in the carburetor. The valve therefore keeps a constant differential between fuel in the feed line and in the carburetor float bowl.

The additional power output of a supercharged engine requires approximately 30 per cent increase in the radiating surface, for, although the air temperature at altitudes is much lower than that at the ground, the density of the air is so much lower that the cooling effect per square foot of radiator surface decreases. Eighty degrees Centigrade is an ideal operating temperature for an airplane engine. If this temperature is maintained at high altitudes, a point is reached where the water commences to boil due to the lower atmospheric pressure. It is therefore necessary to seal the entire cooling system and have a pressure relief valve which will not open until a pressure greater than atmospheric is reached.

The torque of a supercharged engine is practically constant with increasing altitude and as the propeller torque decreases with altitude, the propeller will speed up. For this reason, a larger propeller must be used which holds down the engine r.p.m. at the ground and allows it to speed up and maintain its normal r.p.m. at the designed altitude of the combined unit.

In the earlier tests no suitable oxygen system was available and a small hand controlled system was made up using compressed oxygen in bottles. The pressure was reduced as through a Rego reducing valve, and the oxygen delivered directly to the pilot's mouth through a flexible rubber hose. This system is reliable and, although somewhat wasteful of oxygen, it has not been replaced up to the present time although the Material Section has achieved some success with a liquid oxygen system, which is more pleasant to use than the compressed oxygen as there is no taste whatsoever.

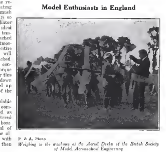
In oeder to relieve the pilot of the necessity of continually watching his supercharger operation, an automatic control has been devised which will maintain sea level pressure at any altitude without attention on the pilot's part. The first of these controls worked satisfactorily up to 10,000 to 12,000 ft., but was not sufficiently powerful to maintain constant adjustment above that altitude. Tests are being carried on and it is quite possible to build an automatic control in the light of our present knowledge which will satisfactorily relieve the pilot of the necessity of continually adjusting the supercharger.

In connection with the supercharger, two special instruments are used. One is a differential fuel pressure gage which shows the difference in pressure between the fuel in the feed line and in the carburetor float chamber. The other is a pressure gage which shows the supercharger air pressure either in lb./sq. in. or in feet altitude. The former gage is now replacing the latter type and the pilot by operating the supercharger control maintains the carburetor pressure at sea level, or 14.7 lb. per sq. in.

Results

The application of the supercharged engine to airplanes increased the performance which it was possible to obtain. For pursuit work the first installation was made on an Orenco having a 300 hp. Hispano engine. The ceiling of the ship unsupercharged was approximately 22,000 ft., and with the supercharger, somewhat better than 33,000 ft. The ceiling of the Martin Bomber without load has been raised from 14,000 ft. to approximately 28,000 ft. by means of the supercharger, while the ceiling with full military load has been increased from 7,000 to better than 12,000 ft. A DH4 with full military load and supercharger will reach an altitude of 28,000 ft. against approximately 18,000 ft. unsupercharged. It should be noted, however, that all of these installations have been made on existing airplanes, and that, with one exception, no airplanes have been designed to take full advantage of the supercharged engine. It is therefore reasonable to assume that even better results will be obtained when this is done. The one exception the Kerber-Boulton CO5, which was designed around the supercharged engine, successfully broke the world's altitude records, carrying weights of 250, 500 and 1,000 kg. In addition, it had a ceiling of around 34,000 ft. At the present time all new aviation engines are being designed to accommodate either a gear driven or turbo supercharger and practically all engines that are used in the Air Service from now on will be equipped with some type of supercharger.

Model Enthusiasts in England



P. & A. Photo

Weighing in the machines at the Aerial Derby of the British Society of Model Aeronautical Engineering

The New Mail Routes

Details of the Advertisements for Bids for the First Routes to be operated under the Kelly Bill

Postmaster General New issued advertisements for bids for eight new air mail routes, on July 15. Sealed proposals for these routes will be received at the office of the Second Assistant Postmaster General until 4 30 p. m., Sept. 15, 1925. A bond of $2,000 is required with each bid. The authority for these routes is contained in an Act of Congress approved Feb. 2, 1925 and commonly known as the Kelly Bill. The detailed regulations were given on pages 458 and 459, Vol. XVIII of the April 27, 1925 issue of AVIATION.

The routes are all designed to connect with the present air mail services operated by the department. The schedules have been prepared requiring an average flying speed of approximately 90 mi./hr. The department realizes that in some instances, due to weather conditions, etc., it may be impossible to maintain such an average but on the other hand when conditions are favorable it may be possible to cover the distance in even better time. Proper allowances will be made in all such cases. The schedules follow:

BOSTON, MASS., BY HARTFORD, CONN. TO NEW YORK N. Y. AND RETURN

Round trips required—Not more than six per week

Leave Boston	5 30 p. m.	Leave New York on arrival of night plane from Chicago due at	6.00 a. m.
Leave Hartford	8 15 p. m.	Leave Hartford	7 20 a. m.
Arrive New York	9 20 p. m.	Arrive Boston	8 20 a. m.

CHICAGO ILL., BY INDIANAPOLIS IND., LOUISVILLE KY. AND NASHVILLE TENN. TO BIRMINGHAM, ALA., AND RETURN

Round trips required—Not more than six per week

Leave Chicago on arrival of New York plane due at	5 45 a. m.	Leave Birmingham	11 45 a. m.
Leave Indianapolis	7 55 a. m.	Leave Nashville	2 05 p. m.
Leave Louisville	9 20 a. m.	Leave Louisville	4 05 p. m.
Leave Nashville	11 10 a. m.	Leave Indianapolis	5.30 p. m.
Arrive Birmingham	1 10 p. m.	Arrive Chicago	7 15 p. m.

CHICAGO ILL., BY LA CROSSE WIS. TO ST PAUL AND MINNEAPOLIS, MINN. AND RETURN

Round trips required—Not more than six per week

Leave Chicago on arrival of plane from New York due at	5 45 a. m.	Leave St. Paul-Minneapolis	3 00 p. m.
Leave LaCrosse	8 40 a. m.	Leave LaCrosse	4 40 p. m.
Arrive St. Paul Minneapolis	10 05 a. m.	Arrive Chicago	7 15 p. m.

CHICAGO, ILL., BY MOLINE ILL., ST JOSEPH AND KANSAS CITY MO., WICHITA, KAN. AND OKLAHOMA CITY OKLA. TO DALLAS AND FORT WORTH, TEX. AND RETURN

Round trips required—Not more than six per week

Leave Chicago on arrival of plane from New York due at	5 45 a. m.	Lve Dallas-Fort Worth	8 00 a. m.
Leave Moline	7 30 a. m.	Leave Oklahoma City	10 25 a. m.
Leave St. Joseph	10 30 a. m.	Leave Wichita	12.10 p. m.
Leave Kansas City	11 30 a. m.	Leave Kansas City	2 15 p. m.
Leave Wichita	1 30 p. m.	Leave St. Joseph	3 05 p. m.
Leave Oklahoma City	3 20 p. m.	Leave Moline	5 25 p. m.
Arr. Dallas-Fort Worth	5 40 p. m.	Arrive Chicago	7 25 p. m.

CHICAGO ILL., BY SPRINGFIELD, ILL., TO ST LOUIS MO. AND RETURN

Round trips required—Not more than six per week

Leave Chicago on arrival of plane from New York due at	5 45 a. m.	Leave St Louis	4.30 p. m.
Leave Springfield	7 55 a. m.	Leave Springfield	5 25 p. m.
Arrive St Louis	8 50 a. m.	Arrive Chicago	7 25 p. m.

ELKO NEV. BY BOISE, IDAHO, TO PASCO WASH. AND RETURN

Round trips required—Not more than six per week

Leave Elko on arrival of transcontinental plane due at	11 15 a. m.	Leave Pasco	8 00 a. m.
Arrive Boise	1 55 p. m.	Leave Boise	10 50 a. m.
Arrive Pasco	4 55 p. m.	Arrive Elko	1 10 p. m.

SALT LAKE CITY UTAH, BY LAS VEGAS, NEV., TO LOS ANGELES, CALIF. AND RETURN

Round trips required—Not more than six per week.

Leave Salt Lake City on arrival of transcontinental plane due at	8 55 a. m. MT	Leave Los Angeles	8 00 a. m. PT
Leave Las Vegas	1 30 p. m. PT	Leave Las Vegas	10 55 a. m.
Arrive Los Angeles	4 10 p. m.	Arr. Salt Lake City	4 30 p. m. MT

SEATTLE, WASH., BY PORTLAND AND MEDFORD ORE., SACRAMENTO SAN FRANCISCO FRESNO AND BAKERSFIELD CALIF. TO LOS ANGELES CALIF. AND RETURN

Round trips required—Not more than six per week

Leave Seattle	9 00 a. m.	Leave Los Angeles	12 00 midnight
Leave Portland	10 55 a. m.	Leave Bakersfield	1 45 a. m.
Leave Medford	1 50 p. m.	Leave Fresno	3 30 a. m.
Leave Sacramento	5 25 p. m.	Arr. San Francisco	5 25 a. m.
Arr. San Francisco	6 20 p. m.	Lve San Francisco	6 00 a. m.
Lve San Francisco	12 00 midnight	Leave Sacramento	7 05 a. m.
Leave Fresno	2 10 a. m.	Leave Medford	10 25 a. m.
Leave Bakersfield	3 55 a. m.	Leave Portland	1 30 p. m.
Arrive Los Angeles	5 25 a. m.	Arrive Seattle	3 10 p. m.

The department reserves the right to modify or change these schedules if the needs of the service demand and operating conditions will permit. Proposal blanks may be obtained from postmasters on the various routes, or from the office of the Second Assistant Postmaster General.

On the route on which is located Dallas and Fort Worth, it is intended that a landing field for receiving and delivering mail shall be located approximately mid-way between these cities. This also applies to the case of St. Paul and Minneapolis.

Bidders should state the number of planes it is proposed to provide for carrying the mails on the route (including the number in reserve for each plane in the air), description of planes, showing number of engines, horsepower, speed, cruising radius.

Bidders and their sureties are urged to acquaint themselves fully with the laws of Congress relating to contracts for carrying the mails and to familiarize themselves with requirements set forth in this advertisement and with the service to be performed before they assume any liability as bidders or sureties, so as to prevent misapprehension or cause of complaint thereafter.

Bidders will be required to furnish bond with two or more individual sureties approved by a postmaster of the first, second, or third class, which bond must be acceptable to the Postmaster General, such sureties to be shown to the owners of real estate valued above all incumbrances at an amount double the amount of the bond required, or a surety company which has complied with the provisions of the acts approved Aug. 13, 1894, and March 23, 1910. A list of such surety companies may be found on page 59 of the Official Postal Guide for July, 1924, a copy of which is furnished each postmaster.

Mail compartments in all planes to be made fireproof to the satisfaction of the Post Office Department.

When a bid is signed by an incorporated company, it should be accompanied by evidence of the authority of the person signing the bid so to sign on behalf of the company. Such evidence may be a certified copy of the proceedings pursuant to which the person was elected or appointed an officer or agent of the company and that part of the by-laws showing his authority as such officer or agent to sign the bid, or a certified copy of a resolution of the board of directors or stockholders conferring such authority upon him.

Bids should be for service as stated in the advertisement.

A proposal altered in any of its essential terms can not be considered in competition with bids submitted in proper form.

The accepted bidder shall execute the formal contract prescribed by the Department covering service advertised, with good and sufficient sureties acceptable to the Postmaster General, and file such contracts within thirty days from date of acceptance of the proposal. The Postmaster General reserves the right to reject all bids.

If the accepted bidder fails to file a properly executed formal contract for the service in the Department within thirty days from the date of acceptance of the bid, or having executed the contract fails to provide the service required, he may be declared a failing bidder or contractor and proceedings taken according to law.

Bids should be forwarded in time to reach the office of the Second Assistant Postmaster General not later than 4 30 p. m. on date specified. Bids received after that time will not be considered in competition with bids received within the prescribed time.

Bids should be sent in sealed envelopes, superscribed "Airplane Proposal," and addressed to the "Second Assistant Postmaster General, Post Office Department, Washington, D. C.

The R. A. F. Display

The Royal Air Force held its Sixth Display on Saturday, June 27, at Hendon Aerodrome, the total number of spectators in the various enclosures was unquestionably a record one for the event, as compared with the previous displays, being at least 100,000 if not more. The visitors started arriving at an early hour, and by 1 p. m. the main enclosures round about the Royal Box, presented a brilliant, animated, and "full-up" appearance. In addition to members of the Royal Family, who arrived later on, there was a most distinguished gathering present.

The first event was a landing competition for a cup presented by the Duke of York. In this event seven units from various training schools, each flying an Avro 504, took part. The competitors took off together in their Avros and climbed to about 1000 ft., and then, one at a time in the order given, they switched off their engines, and each made an attempt to land his machine in a "field" 150 yd. square marked out on the field by light posts and fabric representing a hedge. This event was won by Sergeant Snailh, No. 2 Flying Training School.

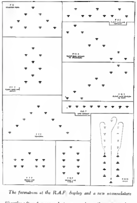
The next event was an interesting and popular one, being a message picking-up competition between a team of two Bristol fighters from the School of Army Co-operation, and each of the four Air Co-operation squadrons. In this event, a message contained in a bag was suspended on a line stretched between two posts. The two Bristol fighters of each team "took off," and then swooped down toward the posts and, by means of a trailing line provided with hooks suspended below the fuselage, snatched up the message. As the machine zoomed upward the observer drew in the message, wrote the reply, and, the pilot meanwhile having maneuvered the machine back over the message picking-up station, the reply attached to a streamer was dropped overboard. Each competitor was timed from the moment the message bag was taken up until the answer was handed to the Umpire, and the times taken by the airplanes of each team were added together, and the team with the smallest aggregate time proved the winner. No. 4 Army Co-operation Squadron won this event.

Light Planes

While this event was in progress considerable interest was aroused when six DH53 light planes were wheeled out of the machine park and lined up in front of the enclosure ready for the next event. This third event was a light plane race open to Directorates of the Air Ministry, and was flown over one of the cross country courses of the old Hendon flying meetings. This was out over Mill Hill and back, a distance of about five miles, the competitors flying two laps of this course. The six DH53's all took off together, flying very close to each other, their Blackburne "Tomtit" engines making a noise similar to a crowd of people enthusiastically clapping their hands. The turning point was in full view of the spectators. Wing-Commander Douglas won this event for the Directorate of Equipment.

In the meantime a deafening roar in the machine park drew attention to event No. 4, the Fly Past of new and experimental types of aircraft. One by one the machines emerged from the park, taxied past the royal enclosure, then, taking off, flew around the field, dipping in salute as they once again passed the royal box. The machines taking part in the fly past were as follows:—

Gloucestershire "Gamecock," single-seater fighter with 400 hp Bristol Jupiter. The Hawker "Heron," previously referred to should have come next in the Fly Past, but for some reason or another did not put in an appearance. The Short "Springbok," an Army Co-operation machine of all metal construction, with a 400 hp. Bristol Jupiter. The Hawker "Hedgehog," a three-seater reconnaissance machine with 400 hp Bristol Jupiter. The Blackburn "Cubaroo," a huge torpedo carrier, coastal defence biplane, fitted with the famous 1000 hp Napier "Cub." The Bristol "Brandon" ambulance plane, complete with Red Cross, with 400 hp. Bristol Jupiter. The DH54, a civil transport machine with accommodation for fourteen passengers, which will be used on the London Continental Air Service by Imperial Airways. It is fitted with a 650 hp. Rolls Royce "Condor." The Vickers "Vanguard," another civil transport machine accommodating 22 passengers, which has been adapted from the Vickers' "Troop Carrier" of similar type. It is fitted with two 450 hp. Napier "Lions."



The formations at the R.A.F. display and a new nomenclature

Shortly after 4 p. m. what was perhaps the principal event of the afternoon took place—Squadron Drill with radio telephony. This was carried out by No. 25 Fighter Squadron, consisting of nine Gloucestershire "Grebes," under the command of Squad. Ldr. A. H. Peck, D.S.O., M.C. Hitherto the leader of a squadron carrying out air drill has signalled his orders to the other pilots of the formation by means of code—either by hand or special movements of the machine. The advent of radio telephony, however, has altered this, and the leader now speaks his commands, which are heard by the other pilots by means of radio, with which each machine is equipped. Not only did the pilots of the eight machines hear Squadron Leader Peck's commands, but a receiving station on the field also picked them up and sent them out over a public address system in the enclosures, so that the spectators—or at least some of them—heard the words of command just as the pilots did.

However, after taking off in "Squadron Mass," the nine "Grebes" flew past in this formation, turned and changed into "Flight Mass Line Ahead." Turning again they flew past in "Flight Mass Line Abreast," then in "Flight Mass Echelon to Starboard and to Port." They then formed "Squadron"—the familiar arrow formation—which was next changed to "Line Abreast" (each machine side-by-side). Then came "Double Line Abreast" (Two rows of four, leader in front, followed by "Double Line Ahead" (four rows of two, leader in front). At this point the leader gave the signal "Awaiting His Majesty's Order." The King then spoke into the microphone before him, saying "Hello, Mosquitoes! Alter course 16 points outward" (i.e., about turn). Immediately the leader executed a loop and half roll from the top, while the others turned sharply in the reverse direction and there was the formation once again in "Double Line Ahead," but flying in the opposite direction. "Mosquitoes" was the call sign of the day for the machines in the air—"Alligator," being the ground station's call sign. All the evolutions carried out by the machines were executed with wonderful precision, in spite of the bumpy wind.

After this came Event No. 6, an aerial combat between a twin engined Boulton and Paul "Bugle" bomber and two single engine "Grebes." The display put up by all three machines was without doubt a really wonderful performance—especially the handling of the big machine.

Event No. 7 consisted of Wing Evolutions by four bombing squadrons, making a total of 36 machines, squadrons 39 and 100 took off together first, each in Squadron Mass formation, and when well up each flew in opposite directions, then turned and flew toward one another, passing, one above the other, when over the center of the field. In the meanwhile the other two squadrons then executed a series of evolutions in remarkably close and regular formation, at the conclusion of which they landed, two squadrons at a time, in Squadron Mass.

Event No. 8, Low Bombing, was by far the most exciting performance of the day, just as the wing evolutions were the most impressive. A flight of No. 25 Squadron on Grebes and a flight of No. 41 Squadron on Siskins, attacked a mock-up tank in the middle of the field. The two formations went up together and after half a circuit of the field broke formation, each machine going to a different point of the compass. Thence they proceeded to dive on the tank independently and apparently haphazard, though in fact there must have been a good deal of method in their madness otherwise there would have been a most unholy crash.

Coordination

The first machine dived on the tank with machine-guns blazing and at a height of about twenty feet dropped a nine-pounder practice bomb, the pilot yanking his machine up into a most terrific zoom as soon as he had loosed the bomb. Before the smoke from the bomb was well in the air another machine had dived almost at right angles to the path of the first one, and as it shot upward after dropping its bomb in came another from a different angle. The machines dived over the heads of the crowd and they zoomed up in the faces of the crowd. The tank was smothered in smoke and as the machines dived they too disappeared in the smoke cloud. On the dive those machines must have been doing a lot over 200 mi./hr.

The machines swooped down so quickly one after the other that two of them did very nearly collide just over the top of the tank, one pilot pulling his machine round sideways just in time to avoid another machine which was crossing his bows. And a moment afterward two others diving from the opposite directions passed one another within inches actually at the bottom of their dives.

Another demonstration followed, by the winners and runners up of a competition, this time in Flight Evolutions, for a Challenge Cup presented by Captain the Hon. F. E. Guest. This demonstration showed the various evolutions carried out in attacking a single hostile machine or a formation, and the demonstrators were three "Siskins" and three "Grebes," two Bristol fighters representing the enemy aircraft. It was an extremely interesting display, especially to those having a knowledge of air fighting. While waiting to attack the "enemy" the six smaller machines flew around in very close formation, seemingly a few feet apart.

An unexpected event came next. Three "Fawns" suddenly came in over the field, and a figure was seen to climb over the side of each machine, and to everyone's alarm, jump overboard. They had not fallen far, however, when from each figure a white parachute opened out, as if by magic, changing a rapid headlong fall into graceful descent. This was the first public demonstration in England of the new parachute equipment which is being issued to the R A F.

As on previous occasions, the afternoon's proceedings were brought to a conclusion by a spectacular "set piece." Just beyond the center of the field could be seen the funnels, masts, etc., of a cruiser (constructed mainly of scrap aircraft material) partly hidden by palms, cojars and other tropical plants. It was supposed to represent an enemy cruiser, the last of the commerce raiders, which had taken refuge up a tropical river, in fancied security. At the moment all was peaceful and sundry commerce ships were observed sailing to and from the ship. Then a Supermarine "Seagull" amphibian came along overhead and "spotted" the cruiser, which promptly opened a heavy fire with her "anties." Strange to say, all her shells burst just a little below and behind the "Seagull." In answer to the latter's S.O.S. five Fairey "Flycatcher" Fleet Fighters flew forward firing frantically at Fritz. This apparently somewhat silenced the "anties" and the "Seagull" and "Flycatchers" went off and reported matters to Headquarters. After a short interval a fleet of heavy bombers, consisting of three Avro "Aldershots," and nine Vickers "Virginias," arrived on the scene from a base conveniently situated close at hand, and with a few, very direct hits put an end to the cruiser.

Another Rotor

International Newsreel Photo

A rotor propeller. An application of Flettner's design by George Jacobs

P. O. Department Bids for Airplanes

On July 15 the Post Office Department opened the bids for the new mail planes. The following table gives the amounts of the bids and is one of the most important tables that AVIATION has published in some time. These machines are all strictly commercial machines and, at a time, such as the present, when there is so much discussion of the possibilities of air transport, these figures provide a basis for intelligent discussion.

A study of the various bids is well worthwhile. The average for the six companies who actually built sample machines are as follows: 3—$20,786, 10—$15,917, 25—$12,929, 50—$11,429. The brief specifications of the desired machines are as follows: Liberty XII engine; Cruising speed, at least, 95 mi./hr., Service Ceiling, 15,000 ft.; Pay Load (Mail), not less than 1,000 lb., Cargo space not less than 50 cu. ft.; Cruising Range, 450 mi. Further particulars are given on page 459, Vol. XVIII, of the April 27 issue.

	Unit Prices—Lots of				
	3	10	25	50	
*Douglas Co.	$16,500	$14,000	$13,000	$12,500	
*Boeing Airplane	22 500	18 720	14 255	11 000	
[illegible] Co., Dayton, Ohio	8 000	7 500	7 000	6 500	
*Aerial Service	19,000	18 000	16 500	15,500	
Lawson Aircraft Co., 1810 Broadway, N. Y.	20 000	14 000	12 000	10 000	
Huff Daland	18 000	14,000	12 000	10 000	
Curtiss	21 000	15 000	11 000	9,500	
*Cox Klemin (1)	21 000	14 000	12 000	10 500	
(2)	23 000	13 500	11 700	10 000	
Consolidated	22 500	14 500	11,000	10,500	
*G. Elias & Bro.	24,500	15 200	12 000	11 000	
Sikorsky	27 000	24 300	22 050	21 000	
	22 000	19 800	18,700	17,000	(wood wings)

* (Built sample planes)

It is reported that the Curtiss and Aerial Service Corp sample mail planes have been purchased by the Department.

Aviation in Honduras

A Frank Statement of Actual Conditions in the Republic of Honduras in Response to Many Requests

By CHRISTOPHER V. PICKUP

The hundred or so aviators and people interested in aviation, who have written me for information during the past few months, have invariably begun their questions by asking what types of planes are in use here. I shall try to the best of my ability to answer all the queries honestly and impartially and though it may seem a bit one-sided it will all be true. Lincoln Standard Tourabouts are being used at the present time. When I came here in November last, the Tela Railroad Company had but one plane, an LS5 which later burned in Teguciglpa. The loss was due to a defect in the gas line connection on the carbureter, and was not the fault of the plane or engine, being merely a weak place in the pipe. That type airplane is very well in its place but not in Honduras at the present time, as there are, contrary to previous reports, but four fields that could at all be termed landing fields. These are at Teguciglpa, the capitol, one at San Pedro, one at Tela and the other at La Ceiba. The last two towns mentioned are ports on the north coast.

We now have two of the Tourabouts with Hisso engines. They are in my opinion the only practical plane for use here. They carry all the load the small fields will permit and make as good a time as any plane of their class. Fast ships are out of the question here at the present time and for a long while to come, due to the exceptionally small fields and the very few emergency fields. Everything connected with aviation in Honduras at the present time is still very crude and much handicapped by the ignorance of the owners of the machines regarding flying in general. All fliers who have been in the game long will have had just such people to deal with at some time or another.

Cross Country

Emergency landing fields are another great draw-back. There are a few that a plane could land in maybe safely, maybe not. They are mostly covered here and there with stumps, holes and great trees or a new growth of brush and tropical vegetation. Should one land more or less safely in one of these places, then your trouble begins—walking in—into almost anything. The country is unsettled and wild and the few scattered native huts would probably be more of a hindrance than a help as the people in general are very ignorant and distrustful. They think little of killing one another, so the chance a Gringo would have in a place like that would be very slim indeed. The few short spurs of railroad follow the coast only a short way inland. Within the radius of forty miles I know of only two fields suitable for even a Standard, and they are both very small and obstructed, full of holes and high grass. We are using three wheeled landing gears and they help a great deal in places like that. Inland from San Pedro there are one or two places in the hundred miles to the capitol one could use as a last chance but after landing it would probably take four or five days afoot to reach a telegraph office. Fortunately I have had no forced landings, but have made the trip from Tegocigalpa to San Pedro, by auto, boat and mule and know just what a lovely trip it is-not, even over a beaten trail where there is more or less travel.

The permanent fields are the most worry to the flier though, as they are the ones which should be good. The field at Tela, the base, is about three miles from town, through tropical growth and across a fair sized creek. The only way to reach it is by gas or hand car on the railroad track. One may wait all the way from ten minutes to three hours for a car to go there on and never tell just when you will get there, so that is another indefinite thing. Arriving at the farm which is as far as the track will take you there is then a walk of about a mile. Remember this must be done four times a day as there is no place near the field to get luncheon. The runway is not more than six or seven hundred feet, east and west, by about a hundred feet north and south. It is rough being real heavy black loam and fifty or so cows running on it wet or dry. They keep even the places that would be fairly smooth, dug up all the time. An irrigation ditch runs through the field both directions. There are tall trees all around it, not a heavy growth but enough to keep the pilot dodging both coming in and going out. There is a good hangar, a nice solid building, cool, airy, and plenty of room. I made drawings for a test stand and work shop which we now have.

San Pedro

The field at San Pedro, a town about forty miles from Tela, is only about six hundred feet in length and twice the width of the plane, poorly located and has a very appropriate grave yard at one end, to pass over in taking off. One barely clears the tombstones with a load. The other end and sides are surrounded by trees and the same old tropical growth. However this field has the advantage of being only about a mile from town, and gas, oil and water are available there.

The field at Teguicigalpa is really good in itself but the surrounding country is bad. Taking off there is a gully about fifty feet deep to go over right at the end of the field. There is a hangar but gas and oil must be brought from town as there are no planes in the capitol permanently. It is about five miles from town, and I have often landed there and waited from forty-five minutes to an hour and a half for an automobile to get into town.

During the fall I made a trip by train to La Ceiba, about forty miles east of Tela, to locate a landing field there. This field is now being prepared and should when completed be a fairly good place. There is another small place there that could be used if necessary. This field was formally a ball ground. This I believe covers the permanent landing fields in Honduras, and gives a clear idea of the emergency ones.

The next thing in importance is undoubtedly the question of mechanic and spare parts. I shall answer the latter first. I have had no trouble getting spares as I haven't needed them but it takes about two or three months to get them when they are wanted. There were a few parts needed in the fall, which were ordered Nov. 15 and Feb. 15 I received notice that they would now be ordered at once. These things are handled through the purchasing agent. It required about three months to get that order approved so it will probably take another three months to get the parts. I foresaw this though, and when the new ships were bought there were also plenty of spares for all ordinary use.

Mechanics

The pilot must do practically all the mechanical work, at least he must know how to do it. True there is a mechanic here, a man whose experience is largely on gasoline motor-cars used on the railroad track. He calls the ailerons "them flappin' things," and all else accordingly. This man is picked by the company and the flier has nothing to say about it. Even to the filling of the oil and gas or water, every act must be watched all the time. The mechanic does help to grind valves and that is some help anyway. When the mechanical work is done and two or three hours have been wasted getting to and from the field, the rest of the time may be spent in flying.

We live in Tela, a United Fruit Company port, and a great deal like a small mining town in the States. The Americans all live in a colony, houses all practically alike, and at home they would be considered very inferior even for rent cheap. They also own the dairy, truck garden, commissary, in fact

everything, and anything that is needed must be bought from them at a very unreasonable price. Living in a foreign country in a place that has an atmosphere of a small American mining town is not nice. The enchantment of a foreign land is all lost, everything being perfectly flat and uninteresting.

Business is not good. The Americans, English, etc., having largely been in Honduras quite a few years, do not keep up well with news or progress at home, and are therefore about like the average person was along in '17 and '18 regarding aviation. This feeling has not been changed much by what little contact they have had with it, since the first planes came here for commercial purposes about two years ago. Theses planes, it is generally understood, were somewhat the worse for wear and gave a great deal of trouble. We are getting a few passengers now to and from the Capitol, and have been making two or three round trips a week for a couple of months with the mail. The rates are seventy-five dollars on a mail trip and one hundred and twenty-five on a special trip, each person, from San Pedro or Tela to Tegucigalpa. Almost all the business is between these points.

There are no other planes flying in Honduras at the present time. There have been a couple of very old seaplanes at Port of Cortez but these are now wrecked and laying on the beach. The Honduranean Government has no air force at all, and never has had any except one or two tramp fliers who would drift in and soon leave. They bought at one time, six Italian airplanes but as each one of them was flown it was wrecked in landing so it took only a short while to finish them all off. Some of the odds and ends of these are still about the hangar at Tegucigalpa. They also purchased a Bristol fighter. Since I have described the fields and conditions in general it is hardly necessary to tell what happened to it.

Summary

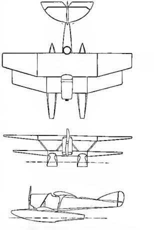
There have been a great many things written and told about aviation in Honduras, and I believe they have been unintentionally very misleading. The country is very poor and money is scarce. Most of the foreigners are trying to save it and the native is doing his best to even get it. One might pick up a few short hops in the larger towns. The price for ten minutes is five dollars so it can be seen that there is no great wealth to be made in a day or two. Aviation to pay here must be gone into as a business not as an adventure. It must be operated by one who is familiar with it in every detail. There being no other satisfactory means of transportation it should prove very practical in this country. The company for whom I am flying have never really tried to get outside business, the planes being used more as a company convenience and a great many things point to there being a political aspect also. Should I seem a bit one-sided it is not because I want to be, but that my desire is to tell the truth about all these things. Flying, at its worst in the States, is much better than flying at its best in Honduras, any time.

New French Experimental Seaplane

The Percheron Co. has recently built for the French navy an experimental type of seaplane which it is claimed is very simple to maintain and to assemble. The machine is a two seater fitted with a 400 hp. Lorraine Dietrich engine and is designed for observation and photographic work.

The cellule is of the double monoplane type, with 566 sq. ft. of surface, the lower wing resting directly on the floats with no intermediary struts and the upper wing resting directly in the top of the fuselage. The wings are of the "multilongeron" type with plywood covering. There are only a few ribs and no interior cross wires. Two braces extend from the fuselage to the lower wings where they are attached to the pontoons while a single strut runs out from the pontoons to the upper wing. The upper wing with a span of 49 ft. 2 in. is quickly demountable so that the plane can be stowed on ship board.

The floats are 24 ft. long and weigh only 308 lb. apiece. They are of rectangular shape and are covered with three ply. The shape is modeled somewhat after that of the Brandenberg floats and have a flat bottom forward and V bottom toward the rear.



Outline drawings of the Percheron Seaplane

The fuselage is made up of four longerons with Warren truss bracing which eliminates the necessity for cross bracing wires. The whole is covered with ply wood. The fuselage is fastened to the wings by centering studs to which bolts are screwed. The whole nose of the machine which contains the Lorraine Dietrich engine, the radiator, the oil reservoir, the instrument board and the engine controls, is detachable by undoing six bolts. The engine bed is made of duralumin, as is also the detachable nose.

The tail surfaces are made entirely of plywood. The controls are manipulated through push and pull rods. The pilot is seated in front of the leading edge while the observer sits behind the trailing edge. Each seat is fitted with a machine gun and the plane can be controlled from either cockpit. The space between the two is reserved for the camera. Oblique photographs are taken through the side of the fuselage. The useful load is 1000 lb., with 4 hr. of fuel, the speed is 110 mi./hr. and the ceiling 16,000 ft.

Quiet Birdmen

In response to many requests, we are able to announce that the Quiet Birdmen have not discontinued but will resume at once. Notices are being sent out.

"Who's Who in American Aeronautics"

The second edition of "Who's Who in American Aeronautics" will be published Sept 1, 1925 Below will be found new biographies that will appear in the forthcoming volume. An invitation is extended to all pilots actively engaged in aviation military, naval or commercial to send their biographical sketches for insertion in the next issue The book will contain the biographies of practically all the leading persons in American aeronautics The price of the book will be two dollars. Orders are being taken in advance as the edition is limited

St. Clair Streett

STREETT, ST CLAIR, 1st Lieut., Air Service, born, Washington D C, Oct. 6, 1894, son of Shadrach Watkins Streett and Lidie Anne (Cogginr) Streett married Mary Lois Williams, Jan 18, 1922

Aeronautical Activities Began flying training Dec 8, 1918 Newport News Va, Service as instructor 3rd A I C Issoudun France Member of 101 31 38th Aero Squadrons in A E F In command Alaskan Expedition 1920

War Service In A E F with Air Service, Oct 29 1917 until Aug 12, 1919

Present Occupation 1st Lieut, Air Service

Address Office Chief of Air Service Washington, D C home Langley Field Hampton Va

Alfred Harold Hobley

HOBLEY, ALFRED HAROLD, Major, Air Service born, New York Jan 21 1887 son of Jesse C Hobley and Charlotte E (Kenyon) Hobley married Grace A Fitzpatrick Sept 28 1909

Educated U S M A West Point 08

Professional 2nd Lieut Inf Feb 14, 1908 1st Lieut. Ord Dept July 1 1911 1st Lieut. Inf. 1911 Capt. Inf 1917 Major Inf and Major Signal Corps, 1917 Lt. Col of Div Mil. Aero., 1918 to 1920 Major Air Service July 1 1920 Student, Ordnance School of Application July 1 1912 to July 1 1913 Student Air Service Engineering School August 15, 1921 to August 15, 1922 graduated

Aeronautical Activities Detailed Major A S S. C Oct. 1917, Duty at Kelly Field and Ellington Field to Feb 15 1918 Organized and commanded Armorer's School Wilbur Wright Field Feb. 15, 1918 to July 1, 1918 Asst Exec. Div of Mil Aeronautics July to October 1918 In charge Armament Sect Engineering Div, Air Service, Oct 1919 to August 1921 A S Engineering School 1921 1922 Asst. Chief of Engineering Div 1922 to 1924 Procurement planning office, 1924

Flying Rating J M A, Jan 1919, Airplane Pilot 1920

Member Engineers Club of Dayton

Present Occupation Procurement planning Representative of Air Service in Dayton District.

Address Mc Cook Field Dayton Ohio home, 911 Delaware Ave. Dayton, Ohio

Boris Viacheslav Korvin-Kroukovsky

KORVIN-KROUKOVSKY, BORIS VIACHESLAV Aeronautical Engineer born Russia Feb 6 1895 son of Viacheslav I Korvin-Kroukovsky and Serafima A C (Sirelnikova) Korvin Kroukovsky married, Eugenia A Novitsky Nov 1 1925

Educated First Corps of Cadets, Petrograd, Emp Nicholas School of Engineering Commissioned as Lieutenant of Engineers Oct 1914 Mass Inst. of Technology Master of Science in Aeronautical Engineering 21

Aeronautical Activities Military Aviation School Gatchino Russia Student from Oct. 1914 to April 1915 Instructor from April 1915 to August 1915 Sixth Corps Squadron Russian Air Force from Aug 1915 to June 1916 Trial Board Bureau of Army Aeronautics Petrograd Russia Member and Test Pilot from July 1916 to Nov 1916 Military Aviation School Gatchino Senior Flying Instructor and Professor of Aerodynamics Nov 1916 to Dec 1918 Russian Embassy Washington D C collection of aeronautical data from June 1919 to June 1920 Curtis Aeroplane and Motor Co. July and August 1920 Aeromarine Plane and Motor Company, Keyport, N J Engineer in charge of Airplane Design specializing on dural umin flying boat construction from June 1921 to Sept. 1924 Sept. 1924 to May 1925, Consolidated Aircraft Corp Buffalo N Y

Flying Rating Military Aviator Russian Air Force April 1915 F A I, Pilot's certificate, No 556, Nov 22, 1917

War Service Russian Air Force, Oct 1914 to Dec. 1918

Member S A E

Present Occupation Aeronautical Engineer

Address 124 Convent Avenue

Paul Weeks Litchfield

LITCHFIELD, PAUL WEEKS, Airship Manufacturer born, Boston, Mass., July 26 1875 son of Charles Manfred Litchfield and Julia (Weeks) Litchfield, married, Florence Brinton, June 23, 1904

Educated Mass. Institute of Tech, S B, 1896

Professional International Automobile Tire Co. 1897 to 1900, Factory Mgr. Goodyear Tire & Rubber Co 1900 to date

Aeronautical Activities Started manufacturing balloons, 1910 Built Vaniman Airship 1911 Visited English and French Field Meets 1910 built Spherical Obs and Dirigible balloons 1918 to date built 72 dirigible airships organized Goodyear-Zeppelin Corp. 1923

War Service Member Naval Commission to study European Airships in England France and Italy 1918 1919

Member Pres Akron Chap, N A A.

Present Occupation 1st V P and Gen Mgr of Goodyear Zeppelin Corp.

Address 1144 East Market St, Akron, Ohio, home, 59 Marshall Ave, Akron, Ohio

Eugene Alexander Lohman

LOHMAN, EUGENE ALEXANDER, Major, Air Service born Las Cruces, New Mexico, March 18, 1885, son of John F Lohman and Julia (Mayer) Lohman married, Lucille M. Crawford, January 8, 1912

Educated Public Schools Las Cruces New Mexico, New Mexico Military Institute, Roswell, New Mexico, graduated 1905, Assistant Instructor, 1905 to 1906, Count of Cadets 1909 to 1911

Aeronautical Activities Primary training, March Field, Cal, 1920 1921, Advanced Flying School (Observation), Post Field Ft Sill, Okla April 1921 to Sept. 1921 Air School for Aerial Obs. Sept 1921 to Dec 1921, Officer in Charge of Training Observation School, Post Field 1921 1924 Transferred to Kelly Field Texas July 1922 and assigned as Dir of Obs A S Advanced Flying School 1922 1924 transferred to command A S Schools Phillips Field, Aberdeen Proving Ground, Maryland.

Flying Rating Airplane Pilot, 1921 Airplane Observer, 1922

War Service Com 2nd Lt Cav, 1911, attended school for 2nd Lieuts., Ft. Leavenworth Kansas 1911, 13th Cav, Ft Riley Kansas Served on Mexican Border, 1912 to 1918, Transferred to 4th Cav, Schofield Barracks Honolulu H T, Detailed Signal Corps 1918 Commanded 7th Field Signal Battalion 1918 Commanded Remount Depot 302, Camp Upton L. I., New York Post Field Mining Science and Tactics, New Mexico Military Institute Roswell N M 1919 1920, detailed to A S, Transferred permanently A S 1920

Member B. P. O. Elks, 969, Roswell N M Roswell Lodge 18 A F & A M, New Mexico Consistory, 1 (32 degrees)

Present Occupation Major Air Service.

Address Phillips Field Aberdeen Proving Ground, Maryland

Stanley E. Knauss

KNAUSS STANLEY E, Aircraft manufacturing born, Chicago Ill Oct 10, 1894, son of Eugene H Knauss and Elizabeth (Holland) Knauss.

Educated Lake View High School, Chicago, Ill.

Professional 1909 to 1914, Advertising Agency 1914 to 1916 Wholesale and Retail Automobile Sales and Advertising

Aeronautical Activities 1919 1920, United Aircraft Engineering Corp. New York 1920 1921 Sales Mgr, Continental Aircraft Inc Chicago Ill 1921 1922 Stout Engineering Laboratories Detroit, Mich 1923 to date, Asst Gen Mgr of Stout Metal Airplane Co., Detroit, Mich

War Service A S M S, St. Paul, Minn. July 25 1918 to Jan 3, 1919

Member Detroit Aircraft Club N A A American Legion

Present Occupation Asst. Gen Mgr Stout Metal Airplane Co.

Address Ford Airport Dearborn Mich home 691 Delaware Ave Detroit, Mich

Charles Perry Mason

MASON, CHARLES PERRY, Lt. Commander U S Navy born Harrisburg Pa Jan 12 1891 son of William C Mason and Gertrude (Rider) Mason, married Ralphine Fisher Feb 29 1917

Educated High School, Columbia Pa U S. N A Annapolis 12

Professional U S. S Connecticut July 1912 to March 1915 U S S Chester March 1915 to May 1916

Aeronautical Activities Student Naval Aviator Pensacola June 1916 to June 1917, Naval Aviator June 1916 Instructor in flying Pensacola Fla June 1916 to Aug 1916 Commanding Naval Air Station Bay Shore L. I., Aug 1917 to Dec 1917, Dec 1917 to May 1918, office of Chief of Naval Operations, Navy Dept, Aviation Section May 1918 to Jan. 1919, Naval Forces in European waters, in charge inspection test and delivery of naval aircraft in France, flew first American built seaplane in France Jan 1919 to Oct 1919 Commanding U S Naval Air Station Key West Nov 1919 to May 1921 Commanding F5L Squadron, Pacific fleet Dec 28 1920 to March 11 1921 made flight with entire squadron from San Diego to Panama and return May 1921 to Oct 1923 Superintendent aviation training Naval Air Station, Pensacola April 1923 flew from Washington, D C to Pensacola Fla in one day, elapsed time 9 hours Nov 1923 to April 1924 Bureau of Aeronautics Navy Dept organizing a special service long distance scouting squadron April 1924 to date head of the Aviation Dept on board the U. S. S. Langley

Flying Rating U S Naval Aviator (H T A) No 52, June 28, 1917 U S Naval Aviator (L T A), July 5, 1919

War Service United States Navy.

Member Army & Navy Club (Wash.)

Present Occupation Lt Commander, U S Navy.

Address U. S. S. Langley c/o Postmaster, San Francisco Calif home Pensacola Fla

Joseph Frederick Meade

MEADE, JOSEPH FREDERICK, Aeronautical Engineer born Buffalo, N Y, Jan 30 1902, son of Joseph Charles Meade and Nettie A (Maynard) Meade, married Ella M Schultz Nov 8 1917

Educated University of Michigan 1917 to 1918

Professional Draftsman Thomas Motor Co. 1918-1920 Howard Motor Co 1920 1921 Sales Mgr Motor Vehicle Co 1921 Hewitt Railway Co 1922 U. S. L & H Co 1924 Curtiss Aero and Motor Co, 1922 to Aerial Service Corp. 1924 1925

Aeronautical Activities Drafting with Curtiss Co during various periods 1918 19 Joined Curtiss Exp. Dept. upon graduation 1917 to 1920 Curtiss Sales & Services 1920 to 1922 Curtiss Eng. Curtiss Factory Supt, 1922 23 Curtiss Eng & Sales Representative 1923 24 Aerial Service Corp. Genl Mgr 1924-25

Member Aero Chamber of Commerce

Present Occupation Aerial Service Corp., Gen'l Mgr

Address Wheeler Ave, Hammondsport N Y house, 53 Lake St, Hammondsport, N Y

Wynne Laurence Le Page

LePAGE, WYNNE LAURENCE Aeronautical Engineer, born London England July 19 1902 son of Charles LePage and Adela (Coquin) Le Page.

Educated Polytechnic, London St Paul's (England) 1918, graduated externally in Aeronautical Engineering

Aeronautical Activities Research 1919 20 Aeronautical Research Staff National Physical Laboratory Eng 1920 to 1923 Aeronautical Research Staff, Mass Inst of Tech 1923 to date

Member R Ae Soc. (Eng) Institution of Aero Eng (Eng), S A E Aeronautical Chamber of Commerce of America

Present Occupation Research Assoc, Department of Aeronautics, M I T

Address Department of Aeronautics, Mass Inst of Tech, Cambridge Mass.

LIGHT PLANES AND GLIDERS

Edited by Edmund T. Allen

Fine Light Plane Flight

The "Pander" a light plane of Dutch manufacture has recently been giving a fine example of the ability of small planes to do cross country flying The machine is a single monoplane fitted with a 25 hp Anzani engine Piloted by Raparlier the plane flew from Rotterdam across the English Channel to London It stayed in England for several days giving demonstration flights and was flown by several English pilots Raparlier then took off for Paris but was forced to stop at Lympne due, it is said, to water in his gasoline The rest of the flight to Paris and then on to Brussels was accomplished on the same day without hitch The whole flight of approximately 750 mi took 12 hr 10 min the average gasoline consumption being about 1 5 gal /hr and the average speed 63 mi /hr or 42 miles on a gallon.

Engines

Dear Mr Allen

In connection with the quest for suitable power plants for light planes may I make a suggestion ?

The present day aeronautical engine such as the Curtiss D-12, Packard 1500, Liberty, Wright A, E, I, H and T models, are the direct descendants of automobile engines. Then why not go back to the source of our first successful designs for light plane engines, instead of to the motorcycle manufacturers ? The only excuse for using the motorcycle engine is the fact that it was, and is, the only engine available for this purpose Everyone who has had any experience with this type of engine is painfully aware of its shortcomings Further, we have received no sympathy from the motorcycle manufacturers who apparently have no desire to learn our requirements

In a recent article you say that 60 hp has been developed in a 160 cu in engine That is remarkably good aeronautical practice, but what about the splendid work of Harry Miller, Fred and Ott Dusenberg and "Papa" Chevrolet ? They are getting more power out of 122 in and expect to get the same power out of 94 in next year These men are capable, if anyone in this country is of developing an engine of around 80 in, light enough to better the HP/W ratio of any motorcycle engine built and far more reliable Years of experience in building engines and cars for the 500 mi. endurance test at Indianapolis has enabled them to build performance into their products in spite of a steadily increasing handicap in the form of reductions in displacement and weight, that are nothing short of marvelous.

Briefly then, since these men have the knowledge, equipment and experience, why not go to them for our light plane engines ?

Sincerely,
MAURICE M DOUGLAS

The Daimler Light Plane L20

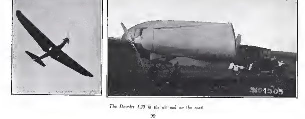
This lightplane is a low wing type cantilever monoplane of large aspect ratio, designed for gliding or soaring flight as well as for power flight. In this it is somewhat like the former Daimler which was described in AVIATION last year. It illustrates a type of construction which has become popular in Germany by reason of their extended use of gliding as a sport.

For use as a pure glider the wings are arranged to shift backward to take care of balance when the engine is removed The engine section is replaced by a light streamlined cap The plane is fitted with dual control for instruction purposes It is easily transported by folding the wings back along the fuselage, in which condition it can be trailed behind a car along the road The disassembly takes but five minutes, reassembly, ten minutes.

The wing has two spars, which, like the ribs, are spruce It is built with a factor of safety of 5 5 a usual figure in German light planes. The fuselage is of conventional design of wood with wire bracing and fabric covering The control surfaces can be quickly removed with quick release fittings. The landing gear is of the axleless type with the shock-absorber in the wings.

The power plant is a Mercedes-Daimler two cylinder engine of 54 cu in displacement. It is geared to the propeller, turning it at 1000 r.p.m

Span	42 ft. 9 in
Length	23 ft.
Wing area	219 sq ft.
Weight empty	480 lb
Useful load	420 lb
Wing loading	4 31 lb /sq ft.
Power loading	43 lb /hp.
Maximum speed	97 2 mi /hr
Minimum speed	32 mi /hr
Ceiling	11,500 ft



The Daimler L20 in the air and on the road

AIRPORTS AND AIRWAYS

Spokane, Wash.

By E. H. Partridge

Forest fire patrol by airplane has been begun in the Spokane district with Lieut. Nick B. Mamer and R. C. Freng as pilots of the two DH ships in use. Twelve national forests in Washington, Idaho and Montana are covered by the patrol. Both airplanes were flown to Spokane from San Diego and the patrol was begun the middle of July. Headquarters will be maintained in the National Guard hangars at Parkwater, Spokane's municipal field. Three mechanics are provided to care for the planes. An elaborate communication system has been devised for use in fire spotting reporting.

National Guard Jennies are kept in the air several hours each day. More of the war pilots have gotten their hands back in and are doing solo work. Sundays are utilized for longer reconnoitering trips and week day hops have a 30 min. limit.

Four Jennies and three Liberty-engined De Havilands now are housed in the National Guard hangars, the total including the forest patrol planes. Because the commercial fliers of the last two years now are active in the Guard, commercial flying has slumped somewhat, giving way to military work and forestry patrol.

Dayton, Tenn-o-see

By Cy Caldwell

Those who know how I love Nature will not be surprised to learn that I have bought a large farm in Tennessee and a small one in Kentucky. These farms, however, were not bought to retire to—they were bought to retire from. I also bought a country road near Dayton, Tenn., and all the trees along one side of it, together with six men in Tennessee and two in Kentucky, also four mules, several fences, and a horse hide. I haven't actually got legal possession of any of this stuff, but I've paid enough to own all of it.

My entry into the sport of farm-buying followed closely upon my exit from flying, caused by a leaking oil tank near Dayton, Tenn., which landed me right plumb in the middle of 20 acres of good corn licker in a crude state. I do not refer to the State of Tennessee—I mean the corn licker was still unfermented and on seven foot stalks.

I had to buy the farm in order to get towed out. Then I purchased four mules and six pretty fair proofs that Darwin knew what he was talking about. With this outfit I pulled and pushed one plane one mile in one day down a mountain and up a valley where I made two hayfields into one flying field, fourth class.

From this bit of real estate I flew pictures of the Scopes Evolution Trial for N.E.A. Service and Pathe News to Cincinnati and Cleveland. That is to say, I flew in the general direction of Cleveland. But I never got there. I lost my oil again—I don't seem able to hang onto oil, somehow. Mother said I never could, as a child.

This time I landed at Williamstown, in the Kentucky Hills, 40 mi. south of Cincinnati. I picked out a cheap looking hill because I knew I'd have to buy it, left the plane, got to Cincinnati by car, and delivered pictures to Hugh Watson who carried them on to Cleveland.

When I returned to Williamstown with a new oil tank I learned from the owner of my hill that a horse he "set a right smart o'store by" had tried to climb a barb-wire fence upon my landing in its pasture, and had lost "a right smart of hide." So I bought its hide and two fences so I could fly out. I was lucky his whole family hadn't been in the pasture, or I'd have had to buy them off the wire too. I have an accountant at work figuring out my profits on the flight. If he can find any I'll say he has a brilliant future as an accountant.

S. G. Irwin of Irwin Aero Service, Chattanooga—imagine them being that advanced in Chattanooga!—Irwin flew pictures for P & A Service and Pathe to Cincinnati in a Jennie. And he got there, too, all the way in a Jennie. This young man will go far in life if he keeps on at that rate. Give him a Curtiss Racer and he'd hit the Pole, North or South—or one of the Bell Telephone poles in between.

Frank Andre delivered copies of *The Knoxville Sentinel* to Dayton. But the poor old Sentinel was left at the post—no Dayton citizen had time to read him. They were all busy hunting roomers at $4.00 per night, without bath or even wash-stand, or boarders at $1.00 per meal—and eat off the oil-cloth. The only thing we weren't charged for were flies—they came free with every meal.

I endured many hardships on that trip including a dinner at the Aqua Hotel and a chat with William Jennings Bryan.

New England

By Porter Adams

More than twenty governors, their families, members of their staff and some forty press representatives were offered an opportunity to inspect naval aircraft and to fly during the Seventeenth Annual Governors Conference held in Maine between June 29 and July 4. The Navy sent an F5L and HS2 and an SC to Thompsons Lake, near Poland Springs for the use of the Governors and the members of their official party, and many of the Governors took advantage of the opportunity offered to fly in naval aircraft. On July 3 the Shenandoah arrived at Bar Harbour and made fast to the U.S.S. Patoka and the following day made a short cruise over Maine with several governors aboard. Upon the return from this flight the Patoka established a new world's record for the mooring of airships when it made the Shenandoah fast in just 18 min. after the Patoka's boat had picked up the Shenandoah's line. All the governors attending the conference showed a very keen and intelligent interest in aviation and even those who did not fly came over to Thompsons Lake and inspected the planes and all showed a great belief in the future of aviation. All in all, the aircraft demonstration was the outstanding feature of the conference and did much to show the distinguished visitors what progress has been made in naval aviation. The Army Air Service had also offered the use of Army planes for the visiting governors and several had planned to fly from Mitchel Field to Portland on the opening day of the Conference, but due to very bad weather conditions and heavy rain this part of the program had to be cancelled.

The Naval Reserve Air Station at Squantum, Mass., continues to pile up a large amount of flying time each week. For the week ending July 11, the station had a total flying time of 66 hr. 8 min. Lt. R. D. Thomas, U.S.N.R.F., executive officer of the station led the list again with a total of 21 hr. 3 min. for the week. It was Lieutenant Thomas who won the Trophy given by the Army and Navy Club of Boston a few months ago to the pilot having flown the largest number of hours without serious accident to property or personnel, and it is expected by Lieutenant Thomas's friends in naval aviation that he will be a very strong contender for the Schiff Trophy.

Lieut. R. C. Moffat, A.S., first commander of the Boston Airport, whose home station is McCook Field, and who has been temporarily at Langley Field, Va., made a flying visit to Boston last week in a Thomas Morse scout. He left Boston on July 13 to return to Langley via Mitchel Field.

Massachusetts National Guard Pilots are strenuously preparing for their two weeks of training at Langley Field which begin on Aug. 29. It is expected that at least one hundred men will represent the 26th division at this camp. Last week the Mass. National Guard flew a total of 25 hr. 25 min. from

the Boston Airport. It is also reported that the National Guard Air Service of Connecticut will have its training this year at Mitchel Field.

Godfrey L. Cabot, president of the N.A.A., who has been living in Washington in the interests of the Association has returned to New England for a few weeks. Much interest is being shown in the Association in New England and inquiries relative to the establishment of chapters have recently been received from Brockton, Mass., and Burlington, Vt.

It was with very great regret that word was received in Boston this week of the tragic death of Lieut. Charles R. Hickey, of Brocton, Mass., and Lieut. Albert C. Perry, of Marlborough, Mass., who were killed in an airplane accident at Westbury, N. Y., on July 13. According to press reports the plane went into a tail spin at between 700 and 1,000 ft. falling into a field and bursting into flames. Both Lieutenants Hickey and Perry were Reserve officers and were assigned to the 443d Pursuit Squadron. They reported at Mitchel Field for duty July 13 together with ten other New England Reserve officers.

In driving around the farm in Vermont, I have heard much regret expressed on the part of the residents along the Connecticut Valley that the airplane service between the Balsams, at Dixville Notch, N. H., and New York is not operating this season. It is a straw that shows the interest in aviation when farmers will travel miles from their homes to enquire why the service is not operating and to express their regret that they do not see the planes passing overhead daily.

Houston, Tex.

Starting off with a big Airport Dinner and an airplane exhibition in the downtown streets, Houston staged the final scene in her big drive for an airport with a huge aerial demonstration at Ellington Field in which over 100 Army planes of nearly every type participated.

Many of the leading citizens of the city were already behind the movement, started by Maj. Bernard A. Law, commanding the 36th Division Air Service, Texas National Guard, to establish an airport close to the center of the city which would at once be the home for his Air Service Unit and a base for commercial, Air Mail and civilian aviation for the Houston district. But it was decided to interest the entire population and get every citizen solidly behind the Committee headed by Jesse Jones, former treasurer of the Democratic National Party, in its efforts for an airport.

A crowd estimated at nearly ten thousand flocked the eighteen miles to Ellington Field on Sunday, June 28, one of the hottest days of the year, and witnessed what is declared to be one of the most extensive aerial exhibits staged in this country.

The program started with three formations of DH4bs maneuvering as one unit and separately and finally forming single file and diving and firing with their front guns at targets only a couple of hundred of yards from the crowd. The spurts of dust about the targets testified to the excellence of the shooting. The fifteen planes then flew broadside past the targets the rear guns keeping the dust flying.

There followed a three ship DH4b formation going through attack maneuvers. They ended their exhibition by diving at the targets in formation, each ship firing four front guns raising a miniature dust cloud and treating most of the crowd to their first sight of the deadly havoc of concentrated attack machine gun fire.

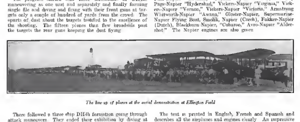
Several Martin Bombers then performed for the crowd, also using their machine guns.

After the big bombers had landed fifteen SE5s and three TMB3s took the air in six separate formations. For fifteen minutes they maneuvered in close formation and surprised the crowd with their ability to hold together even during sharp turns and simple stunts. Finally they formed single file, and using 25 lb. practice bombs, obliterated and finally set on fire a large target representing a battleship, that had been built three hundred yards out from the line of ships and the crowd. After the bombing each ship went through every stunt in the pilot's categories. Eighteen of them, looping, spinning, rolling, Immelmanning, twisting and turning presented a sight reminiscent to old pilots of a raging "dog fight" on the western front during the war. The planes of the 36th Division, Texas N. G. also took the air and with their TW5, Vought, two TW3s and eight Jennies made a very presentable showing.

The final episode on the program was a parachute jump. The wind was slow and the jumper came down easily and landed near the center of the field. During his descent he was circled by DHs and SE5s at a safe distance.

Every person attending the show was presented with a circular calling attention to the fact that it had taken them one hour to ride out to Ellington Field, that in that time a modern Commercial Liner could be 100 mi. on its way to San Antonio, Dallas or New Orleans and showing the necessity of having an airport located within fifteen minutes of Houston's business district if Houston was to keep to the front as a leading city of the southwest.

The Civilian Committee, aided by National Guard and Reserve interests in Houston has completed plans for the new airport, chosen the land, and expects to break ground for what will be the best airport in the Southwest about the first of August.



The line up of planes at the aerial demonstration at Ellington Field

The Napier Book of Engines

AVIATION has received a copy of the most elaborate aircraft catalog that has ever come to it for review. It was sent with the compliments of D. Napier & Son, the manufacturer of Napier aero engines whose factory is at Acton, London, England. It has been priced at one guinea and is well worth it. The illustrations in the book are all on heavy cardboard and reproduced by the gravura process.

The airplanes shown represent some of the foremost types of British aircraft such as the Avro-Napier "Bison," Blackburn-Napier "Blackburn," Blackburn-Napier "Dart," Handley Page-Napier "Hanley," Fairey-Napier IIID, Fairey-Napier "Pintail," Supermarine-Napier "Seagull," Vickers-Napier "Vanellus," English Electric-Napier "Kingston," Boulton and Paul-Napier "Bodmin," Parnell-Napier Possum, Handley Page-Napier "Hyderabad," Vickers-Napier "Virginia," Vickers-Napier "Vernon," Vickers-Napier "Victoria," Armstrong Whitworth-Napier "Awana," Gloster-Napier, Supermarine-Napier Flying Boat, Smolik, Napier (Czech), Fokker-Napier (Dutch), Blackburn-Napier, "Cubaroo," Avro-Napier "Aldershot." The Napier engines are also given.

The text is printed in English, French and Spanish and describes all the airplanes and engines clearly. An impressive list of achievements of the Napier engines is listed. It is a pleasure to record the excellent impression that such a book creates in a field where there is so little effort made to display the products of aircraft factories to their greatest advantage.

UNITED STATES AIR FORCES

U. S. ARMY AIR SERVICE

Pilot Books

Editor, Aviation

I have been directed by the Commanding Officer, Air Service Primary Flying School, Brooks Field, to request you to publish the enclosed memorandum I believe the memorandum is self-explanatory

During a recent investigation, it was disclosed that cadets discharged from this Station were carrying away with them pilot books filled with an abundance of unauthorized flying time The entries were forged and the records absolutely unauthentic.

It is our fear that the consequences resulting from this practice may be grave. A cadet discharged from this School for flying deficiencies has but little flying time—is unable to pilot any kind of an airplane—and in most cases is dangerous Should such a cadet receive a responsible position by use of the false records contained in bogus pilot books as evidence of his flying time and ability, we could readily understand how he could kill himself, or more important, kill his passengers in short order.

This practice has been going on for some time and quite a few of these false records have gotten away from the Field before they could be stopped. We also know definitely of positions gained by discharged cadets by use of these false records

In an effort to avoid any serious consequences, we are having the enclosed memorandum published throughout the country in order to forewarn aircraft companies and other persons who would be likely to have occasion to consider the applications of ex-flying cadets for positions involving flying

I hope you may perceive the worthiness of this idea and will do us the favor of publishing this memorandum in some form or another.

Paul W Wolf,
2nd Lieut. A.S. Information Officer

Headquarters Brooks Field, Office of the Information Officer

It has come to the attention of the authorities at Brooks Field that for some time discharged cadets, eliminated for flying deficiencies, have had access to and in a number of cases have carried away with them Pilot Books with false entries of flying time therein These Pilot Books give the appearance of being certified to and seem to be an authentic record when in reality they are false representation The difference in flying time between the real and the falsified records of an eliminated cadet in certain cases has been great

It is strongly urged that civilian companies contemplating giving a position to an ex-cadet will in the future not accept the flying time recorded in a Pilot Book as certain to be correct Authentication of the amount of time and also of the applicant's general flying ability will be furnished from Brooks Field when requested

Senator Bingham in Northwest

Senator Hiram Bingham leaving Seattle at 9 10 a. m June 26, arrived at Camp Lewis at 9 30 a. m He was escorted from Seattle by planes of the 3rd Division Air Service from Camp Lewis and by an additional plane from Sand Point piloted by 2nd Lieutenant Goldsmith, of the Organized Reserves. The plane in which the Senator was passenger was piloted by 1st Lieut T J Koenig, of the Air Service, executive of the Organized Reserve Air Service Units with station at Seattle

Upon his arrival at the Camp Lewis landing field Senator Bingham was met by Maj Gen Wm H Johnston, the Camp Commander, and his Staff, Mrs Johnston and Brigadier General Alexander and his Staff J C. Carman, Chester A Thorne, Frank S Baker and J. A Eves of Tacoma were also present and greeted the Senator

Senator Bingham addressed all officers on duty at Camp Lewis at the Officer's Club The subject of the Senator's address was "What to Expect from the Air Service in the Future as a Fighting Unit." Senator Bingham, who was a lieutenant colonel of Air Service during the War, took up some of the technical and tactical developments of the Air Service since the war. He stated that he was not an advocate of a separate Air Service, but that he did believe that the conditions of service in that branch were different from the remainder of the Army and that personnel was therefore entitled to special consideration

At the conclusion of his speech Senator Bingham was taken to the Airdrome where he entered an airplane at 11 30 and was escorted by the Camp Lewis Air Service Unit on his return to Seattle He arrived at Sand Point at 12 20 Senator Bingham will visit Alaska and, upon the urgent request of General Johnston, has promised to again visit Camp Lewis and Tacoma when he returns

THE TRAINING CAMPS

Rockwell Field

The following is a list of the members of the Reserve Officers' Training Camp who have reported for training The camp will run from June 19 to July 29

From the University of Washington—Henry Bartlett, Harold R Brown, Duane M Covington, Edward W Davidson, Jr, Harry Henke, Jr, Paul A Jaccard, Horace L Jennerson, Herbert A Landeen, Lloyd Larson, A Elliott Merrill, George I Owens, William B Parsons, W. W Roney, Harold M Stratton, George S Woodworth, Clayton A Scott

From the University of California—Allan Ashley Barrie, Howard B Cock, Lawrence John Chiappino, James Arthur Dixon, Louis Howard Enos, Homer Joseph Fallar, Frederick Hyde Hibberd, John Alexander Kerr, Erhardt Carl Kaerper, Harold Edmund Newman, Raymond Charles Olsen, Clarence W Parham, Howard William Parker, Ray Maxwell Potter, George Frederick Tinkler, Paul I Doty

The training camp is under the command of Major Henry C K Muhlenberg, A S-D O L, assisted by the 91st Observation Squadron from Crissy Field, San Francisco, Calif

The instruction is Ground Instruction in the morning, consisting of observation of available aeronautical engines, first aid, etc., and the afternoon instruction on four days a week—practical flying in the rear seat observing for, and working with troops on the ground

In addition to the above, there is cross country flying in the morning two days a week Those who have served with Air Service R O T C camps at other posts can readily appreciate the great privilege of spending six weeks at Rockwell Field, where the climate is conducive to good work, and the amusement facilities are of a very high order

Kansas City, Mo.

By Allen Quinn

The annual summer flying school for Air Service Reserve officers of the 7th Corps Area opened at Richards Field Monday, July 6, with 41 officers as members of the first of three classes The second class will begin July 26, and the third Aug 16

Major B G Wier, commander of the 16th Observation Squadron, Fort Riley, Kans, is in charge of the school Capt B F Giles is chief instructor and Lieut C H Parrett is field adjutant. Both are of Fort Riley Lieut Isaiah Davies, regularly in command at Richards Field, is acting as adjutant for the duration of the school

Officers and men of the 16th Observation Squadron and the 9th Photo Section are now quartered at the Field The government recently signed another year's lease for the use of Richards Field

Army Air Orders

Resignation Sec. Lieut George James Smith, A S, accepted

Maj John H Jouett, A S, appointed to board for selection of candidates for appointment as second lieutenants

Brig Gen James E Fechet, Asst Ch A S, Lieut Col Clifton C Carter, professor, U S Mil Acad, Maj Jonathan M Wainwright, Gen Staff, Capt Eugene O Hopkins, Fin Dept., appointed to meet at Washington, for the preparation of courses in Air Service training for cadets at U S Mil Acad and for officers and student officers at Com & Geo Staff Sch

First Lieut George Leroy Murray, A S Res., Washington, to active duty Bolling Field, reverting to inactive status Oct 10

Detail of Sec Lieut Eugene B Ely, Field Art in A S., amended to relieve Lieutenant Ely from duty in A S, upon completion of instruction A S Adv Fly Sch, Kelly Field

Sec Lieuts. Rodney Stuart Lamont, A S, Rock Island, and Harry Wilson McGee, A S, Terrace Park, to active duty Selfridge Field, reverting to inactive status Jan 14, 1926

Sec Lieuts David Louis Behncke, A S., Forest Park, Ill., and Foster Virginia Tompkins, A S, Houston, to Langley Field, reverting to inactive status Jan 14, 1926

Capt Charles William Childress, jr., A S Res., Fort Worth, to active duty Kelly Field, reverting to inactive status Jan 14, 1926

First Lieut Arthur B Custis, A S (Ord Dept.) relieved from detail A S, to take effect upon completion of instruction A S Adv Fly Sch, Kelly Field

Capt James L Hatcher, A S (Ord Dept) relieved from detail A S., to take effect upon completion of instruction A S Adv Fly Sch, Kelly Field

Capt Charles P Clark, A.S, Scott Field, to Langley Field.

First Lieut. Edwin B Bobzien, A S, Chanute Field, to San Francisco, sailing September Gov trans for Philippine Islands.

First Lieut. James C Cluck, A S, Kelly Field, to New York City, sailing on Gov trans, Nov 24 for Canal Zone

First Lieut Lewis S Webster, A S, to Langley Field, upon completion of tour of foreign service

Serg Ernest Jenkins, A S, Kelly Field, retired

Maj Frank M Andrews A S, detailed as Asst Com A S Adv Fly Sch, Kelly Field.

Maj Earl L Naiden, A S, detailed as Asst Com A S Tech Sch, Langley Field

Capts Leo Andrew Walton and Ralph Pittman Cousins, A S, promoted to rank of major and First Lieut Elmer Edward Adler, A S, promoted to rank of captain, all officers remaining in present duties.

First Lieut Harry A Sutton, A S, McCook Field, to Mass Inst Tech. for instruction

U S NAVAL AVIATION

N.A.S., New York Harbor

The air station at Fort Hamilton, New York City, manages to pile up considerable flying time with only one N9 seaplane in commission at the present time During the week of June 27, 125 flights with a total flying time of 26 hr 14 min. were recorded The corresponding figures for the week of July 4 were 54 flights totaling 18 hr 7 min. and for the week of July 11, 75 flights with a total time of 13 hr 15 min During the week ending July 18, 79 flights with a total time of 24 hr 11 min were made For the month of June, with two planes in commission up to the thirteenth and one thereafter, this station put in 93 hr of flying time

On June 25, an SC and an H16 arrived from Anacostia at 12 30 p m and were serviced up and on their way to Bar Harbor, Me, at 3 15 p m The following week an F5L stopped off for service on its way to the same place These three planes arrived at New York on July 11 on their way back to Anacostia. The H16 left the morning of July 12 and the other two at noon on the thirteenth

M.C. Tests B.B.T. Light

The first of a series of tests with the new 500,000,000 candlepower B B T light, recently installed on Air Mail landing fields, was conducted July 16 at Brown Field Quantico, Va, by pilots of the 1st Aviation Group, Marine Corps, before officers of the Navy and Marine Corps

Located on the center edge of the flying field, the flood light with a lighthouse lens illuminated an area of over one-half square mile and from such a low elevation that the hazard of blinding the pilots on landing and taking-off was eliminated

A detailed program had been arranged, including comparison between the new flood light and the Navy Sperry searchlight, developed for night landing field illumination and flights of seaplanes from the water, but shortly after dark a thunderstorm arose and delayed operations. When the rain stopped and the spectators once more could emerge in the open, more planes took-off the last one landing at 10 30 o'clock.

Rear Admiral William A Moffett, chief of the Bureau of Aeronautics, was enthusiastic over the display and W B Mayo, chief engineer for Henry Ford, observed the tests with intense interest, although he had seen this type of light in practical use at the Air Mail Field in Cleveland.

Capt L J Bourne, executive officer of Brown Field, and Lieut. C S Schildt made flights in Voughts They taxied their planes out of the area of light and their wheels left the ground just as they reached the edge of illumination On the gradual climb they were entirely out of the light's beam. Following the storm Captain Bourne and Major E H Brainard, chief of Marine aviation at the Navy Department here made flights in DH4B's, as did Lieuts Stanley E Ridderhof and W G Farrell

Col T C Turner, in command of Brown Field, said the tests will continue for about a month under all possible conditions before a report is submitted to the Navy Department.

Admiral Moffett came to Quantico late in the afternoon in his H16 seaplane He was accompanied by Comdr H C Richardson, Comdr Kenneth Whiting, Lieut Comdr Marc A Mitscher of the Bureau of Aeronautics, and Lieut. Comdr Homer C Wick, commanding officer of the Naval Air Station Lieut A J Williams, jr, flew the big boat down and returned to Washington immediately. Lieutenant Commander Wick returned to Washington by plane with his executive officer, Lieut George T Cuddihy, about 11 o'clock, while Admiral Moffett and his party went back by automobile. Major Brainard also returned by air Three officers of the office of chief of Army Air Service made the trip to and from Quantico, landing about 11 o'clock They were Capt Ira Eaker, Lieut. George Hodge and Lieut Donald Duke

Navy Air Orders

Lt John S Farnsworth to resume duties Air Sqd. Sctg Flt upon completion temp duty

Lt. (jg) Walter F Weidner det. U S S Hannibal to temp duty Nav Air Sta., Pensacola.

Ens. John R McKinney det. U.S.S Nokomis to temp duty Nav Air Sta, Pensacola.

Ch. Gun Charles E. Smitherman det Bu Aero to Nav Air Sta, Pensacola

Lt (jg) Stuart H Ingersoll det U S S Borie to temp duty under instr Nav A Sta, Pensacola

Ens Wallace R Guitar det U S S Borie to temp duty Nav Air Sta, Pensacola

Ens. Homer B Hudson det U S S Borie to temp duty Nav A Sta., Pensacola

Lt. (jg) John F Gillon det Rec Ship, San Francisco, to temp duty Nav A Sta, Pensacola

Lt (jg) John B Mallard det Nav A Sta, Pensacola, to U S S Sharkey

Ens William D Anderson det Dest. Sqds. Sctg Flt to temp duty Nav A Sta, Pensacola.

R E Avery Stewart det Aircraft Sqds, Battle Flt., to U S S Colorado

Lt Herbert S Woodman det Nav A Sta, Pearl Harbor, T H, to continue treatment Nav Hosp, San Diego

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Altimeters	$ 5.00	Hisso 150 H.P. propellers	$20.00
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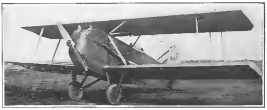

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